

**Three new species of genus *Tamopsis* Baehr & Baehr from
Western Australia (Arachnida, Araneae, Hersiliidae).
Second supplement to the revision of the Australian Hersiliidae.**

Barbara Baehr* and Martin Baehr*

Abstract

Three new *Tamopsis* species from Western Australia are described: *Tamopsis nanutarrae* sp. nov., *T. marri* sp. nov., and *T. mallee* sp. nov. Their relationships within genus *Tamopsis* are discussed.

Introduction

During travel through Western Australia in 1987 a sample of Hersiliidae was collected mainly in the southwestern corner of Western Australia, but also as far north as Ashburton River south of Hamersley Range. Apart from several additional records of the recently described species *Tamopsis perthensis* Baehr & Baehr and *T. occidentalis* Baehr & Baehr and of some indeterminable juvenile specimens, three new species were discovered. Their description is regarded a second supplement to our recent revision of the Australian Hersiliidae (Baehr & Baehr 1987). Descriptions and measurements were taken as indicated previously (Baehr & Baehr 1987, 1988). Eye ratio was taken in the following order: AME : ALE : PME : PLE. The holotypes of all three species are deposited in the Western Australian Museum.

Abbreviations

ALE	anterior lateral eye
AME	anterior median eye
bS	basal segment of posterior lateral spinneret
CBM	Collection B. Baehr, München
LB	total length of body
LL	total length of legs
PLE	posterior lateral eye
PLS	posterior lateral spinneret
PME	posterior median eye
tS	terminal segment of posterior lateral spinneret
WAM	Western Australian Museum, Perth
I	1st leg
II	2nd leg
III	3rd leg
IV	4th leg

*Zoologische Staatssammlung, Münchhausenstr. 21, D-8000 München 60, F.R.G.

Systematics

In our revision of the Australian Hersiliidae all known species were transferred from *Chalinura* or *Tama*, respectively, to a new genus *Tamopsis*. Except for the singular *Hersilia australiensis* Baehr & Baehr, all other Australian Hersiliid species are now included in this genus. As the three species described herein belong also to *Tamopsis*, a generic diagnosis is not needed. Most important differentiating characters for species are still structure of male palpus and of female epigyne and vulva.

Tamopsis nanutarrae sp. nov.

(Figures 1, 2, 9)

Holotype

Male, W.A. Ashburton River at Nanutarra Roadhouse, 3 November 1987, M. Baehr (WAM 88, 1428).

Diagnosis

Small species with high eye area, large AME, and fairly elongate legs, recognized by male palpus with simple, only slightly excised apex of lateral apophysis and median apophysis without marginal hook, but with unique, strongly folded and incised median lamella.

Description

Measurements: Length 3.05 mm; cephalothorax length: 1.35 mm; width: 1.35 mm; abdomen length: 1.70; width: 1.28 mm. Legs: I: 10.56 mm, II: 9.36 mm, III: 3.64 mm, IV: 8.82 mm; ratio: 1:0.89:0.34:0.84. Ratio LB/LL: 0.29. PLS length: 1.44 mm; bS: 0.46 mm; tS: 0.98 mm, Eye ratio: 1:0.30:0.69:0.81.

Colour: Cephalothorax dark yellowish, eye area, middle of clypeus, and anterior surface of chelicerae, lateral border, and some radial spots brown. Abdomen whitish, laterally and posteriorly slightly mottled, lateral borders and a lancet-shaped median stripe dark. Ventral surface light. Legs yellowish, femora on outer and inner surface with a dark stripe. Spinnerets without distinct pattern.

Cephalothorax: Circular, c. as wide as long, and as wide as abdomen. Eye area strongly raised, clypeus c. as high as eye area. AME by far largest, PLE rather larger than PME. Distance AME/AME and distance AME/ALE less than diameter of AME. Distance PME/PME c. half of diameter of PME, distance PME/PLE slightly greater than diameter of PLE. Chelicerae almost twice as long as wide. Sternum pentagonal, hirsute.

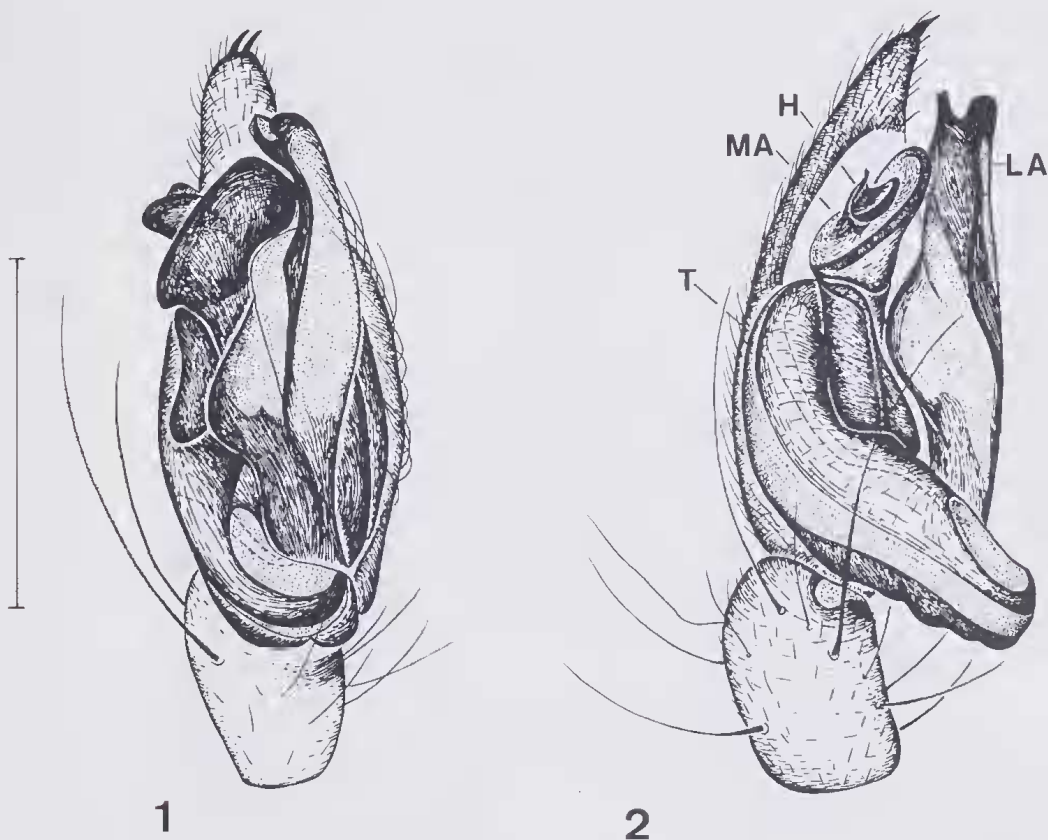
Abdomen: Elongate, rather parallel, much longer than wide and c. as wide as cephalothorax. Dorsally with five pairs of circular muscular pits. Ventral muscular pits in a narrow v-shaped arrangement. PLS considerably shorter than abdomen, tS comparatively short.

Legs: Measurements see above. Moderately elongate, III rather elongate.

Palpus: Median apophysis contorted, apex widened, with wide, membranous area within. Lateral rim of apex without any hook-like process, simply bordered. Within

membranous area a strongly sclerotized, contorted, and apically excised process directed outwards. Lateral apophysis slightly contorted, apex simply excised, embolus hidden.

Female: Unknown.



Figures 1 and 2. *Tamopsis nanutarrae* sp. nov. Holotype. Male palpus. 1. ventral view, 2. lateral view. Scale: 0.5 mm. See abbreviations p. for Figure 2.

Etymology

Derived from the type locality.

Distribution

Thus far known from type locality only, central western part of Western Australia.

Habits

Caught from bark of river eucalypt (*Eucalyptus camaldulensis*) near the bed of Ashburton River within spinifex semi-desert, together with *T. occidentalis* Baehr & Baehr. Like this species, *T. nanutarrae* lives in small hollows or crevices on the whitish bark of river eucalypts, where detection is extremely difficult. While specimens of *T.*

occidentalis at this locality were seen to eat ants, *T. nanutarrae* (the holotype) was observed by the second author to have caught another spider (presumably a Theridiid).

Relationships

The high eye area as well as shape of lateral apophysis of male palpus with hidden embolus suggest relationship of *T. nanutarrae* with the *tropica*-group of the revision (Baehr & Baehr 1987). Lack of a scopula-like organ and of the hook-like process on the rim of the median apophysis, however, demonstrate the rather primitive status of *T. nanutarrae* and preclude its inclusion in the *tropica*-group. The peculiar median process within the apex of the median apophysis is a strong apomorphic character of this species, not known in any other species. Hence, *T. nanutarrae* is certainly very closely related to the *tropica*-group, but merits the erection of an own group.

Identification

For identification the key to species in our revision (Baehr & Baehr 1987) should be altered as following:

Couplet 13(4): after "(Figs 27, 29)" add: "or hidden in LA 13a."
Then add: "13a(13). Apex of embolus hidden in LA. Apex of MA with a peculiar, excised, projecting process within, without a hooked process on lateral rim. Northwestern Australia south of Great Sandy Desert *nanutarrae*, sp. nov.
– Apex of embolus freely projecting beyond LA. Apex of MA without a projecting process within, but with a hooked process on lateral rim 14"

Tamopsis marri sp. nov. (Figures 3, 4, 5, 6, 9)

Holotype

Male, W.A., Stirling Range Nat. Pk., North border, 28 November 1987, M. & B. Baehr (WAM 88 1429).

Paratypes

1 male, 4 females, 4 cocoons, same locality, same data (CBM); 1 male, 3 females, W.A., Boyup Brook, Town park, 23 November 1987, M. & B. Baehr (WAM 88 1430, CBM).

Diagnosis

Medium-sized species with high eye area, large AME, and elongate legs, recognized by male palpus with median apophysis with strong hook-like process and high lateral rim, and apex of lateral apophysis with two deep incisions, and by female vulva with median receptaculum seminis larger than lateral and with a sclerotized median bridge.

Description

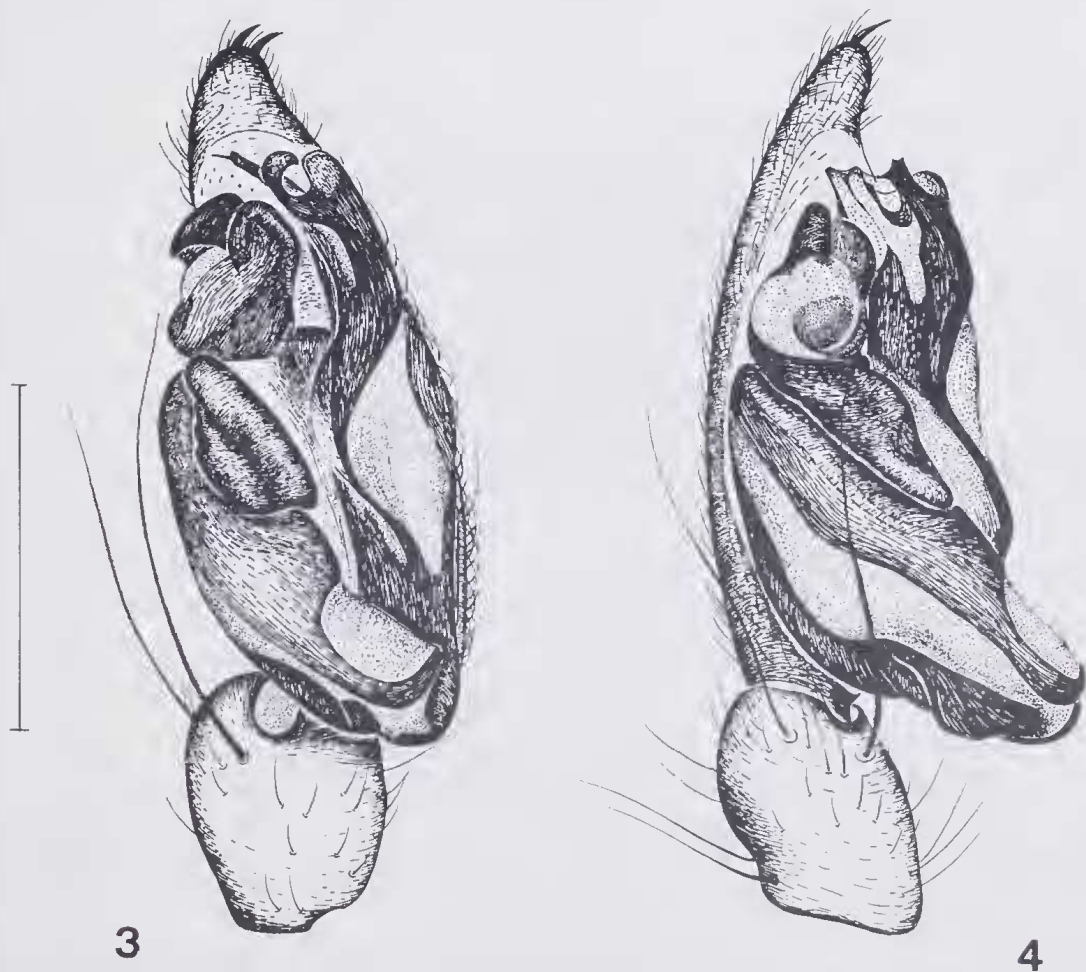
MALE HOLOTYPE

Measurements: Length: 4.2mm; cephalothorax length: 1.68mm; width: 1.56mm; abdomen length: 2.44mm; width: 1.72 mm. Legs: I: 14.44mm, II: 13.66mm, III:

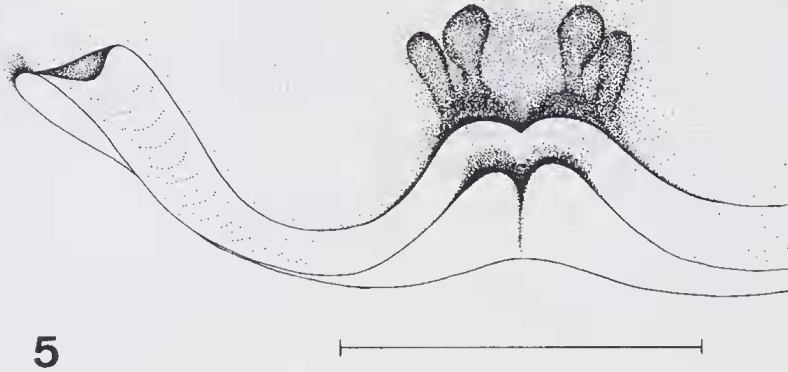
4.44mm, IV:: 12.86mm. Ratio: 1:0.94:0.31:0.89. Ratio LB/LL: 0.29. PLS length: 2.20mm; bS: 0.56mm; tS: 1.65mm. Eye ratio: 1:0.31:0.68:0.79.

Colour: Light reddish with anterior part of eye area, lateral border of cephalothorax and some radial spots piceous. Abdomen strongly mottled, with conspicuous lancet-shaped stripe dark. Ventral surface whitish. Legs light, with indistinct dark stripe on inner and outer surface of femora. Basal segment of palpus with a dark spot on inner and outer surface each, terminal segment anteriorly black with a conspicuous yellow spot. PLS with two rather inconspicuous dark rings.

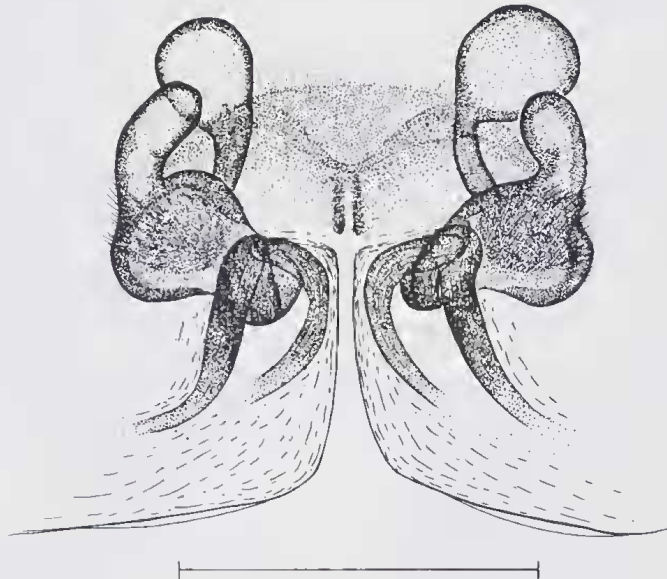
Cephalothorax: Circular, slightly longer than wide, almost as wide as abdomen. Eye area strongly raised, clypeus almost as high as eye area. AME by far largest, PLE larger than PME. Distance AME/AME slightly less than diameter of AME, distance



Figures 3 and 4. *Tamopsis marri* sp. nov. Holotype. Male palpus. 3. ventral view, 4. lateral view. Scale: 0.5 mm.



5



6

Figure 5. *Tamopsis marri* sp. nov. Female epigyne. Scale: 0.5 mm.

Figure 6. *Tamopsis marri* sp. nov. Female vulva. Scale: 0.25 mm.

AME/ALE c. half of diameter of AME. Distance PME/PME c. $\frac{3}{4}$ of diameter of PME. distance PME/PLE considerably larger than diameter of PLE. Chelicerae c. twice as long as wide. Sternum pentagonal, hirsute.

Abdomen: Elongate, much longer than wide, slightly ovoid. Dorsally with five pairs of circular muscular pits. Ventral muscular pits in a narrow v-shaped arrangement. PLS shorter than abdomen, tS moderately elongate.

Legs: Measurements see above. Rather elongate, III moderately elongate.

Palpus: Median apophysis strongly contorted. Apex with a large membranous area and a scopula-like organ within. Ventral border with strong, overhanging tooth-like process, lateral rim high, lamelliform. Lateral apophysis also contorted, apex with two deep incisions, the lateral one conspicuously circular.

FEMALE PARATYPE (WAM 88/1430)

Measurements: Length: 5.56 mm; cephalothorax length: 2.08 mm; width: 2.04 mm; abdomen length: 3.40 mm; width: 2.56 mm. Legs: I: 13.40 mm, II: 12.96 mm, III: 4.48 mm, IV: 11.48 mm. Ratio: 1:0.96:0.33:0.88. Ratio LB/LL: 0.41. PLS length: 2.28 mm; bS: 0.64 mm; tS: 1.64 mm. Eye ratio: 1:0.32:0.70:0.78.

Colour: Similar as in male, but legs and palpi distinctly annulate.

Cephalothorax: Circular, almost as wide as long, much narrower than abdomen. Clypeus as high as eye area. Size of eyes and distances between them quite similar to male.

Abdomen: Considerably wider than cephalothorax, though much longer than wide. Arrangement of dorsal and ventral muscular pits as in male. PLS slightly shorter in relation to abdomen than in male.

Legs: Measurements see above. Shorter than in male, III relatively longer.

Epigyne: Laterally with large opening, covered by a small plate. Most probably the hook-like processes of medial apophysis of male are locked into these openings during mating.

Vulva: With two receptacula seminis and a basal bulbus. Inner receptaculum larger and with globular apex. Basal bulbus glandular. Introductory ducts medially coiled, both ends processed back and outwards, respectively. Vulva anteriorly with a sclerotized, medially interrupted bar.

Cocoon: A circular, much depressed, whitish plate without any peculiar surface structure, attached to the bark of trees, watched by the female.

Variation: Some variation of size noted, one female 6.3 mm long, otherwise rather similar, only pattern in some specimens more vivid.

Entymology

Halludes to the Marri tree (*Eucalyptus calophylla*) on which it was found.

Distribution

Southwestern corner of Western Australia.

Habits

Caught from bark, especially in small hollows, of Marri (*Eucalyptus calophylla*), where it lives in the same way as *T. occidentalis* (Baehr & Baehr 1987).

Relationships

Highly evolved species of the *tropica*-group (Baehr & Baehr 1987), extremely closely related to *T. occidentalis* Baehr & Baehr (presumably the sister species) and perhaps also to *T. pseudocircumvidens* Baehr & Baehr. Distinguished from *T. occidentalis* by minor differences of male palpus and female genitalia: Median apophysis of *T. marri* with scopula-like organ slightly smaller, overhanging tooth larger, and lateral rim more lamelliform. Lateral excision of lateral apophysis conspicuously circular. Median receptaculum of female longer than lateral, and introductory duct much more coiled and bent outwards. The relationships with *T. pseudocircumvidens* are more obscure, because the male of this species is still unknown. The female vulva, however, is rather similar and differs only in the more coiled introductory ducts of *T. marri*. Females of *T. marri* are also generally larger and lack the conspicuous dark and white pattern of clypeus present in *T. pseudocircumvidens*. Anyway, with regard to the male palpus, *T. marri* is one of the most highly evolved species of the *tropica*-group, with exception of *T. fitzroyensis* Baehr & Baehr and the following species.

Identification

For identification the key to species in our revision (Baehr & Baehr 1987) should be altered as following:

Couplet 18. Instead of "North-western Australia" add "Western Australia . . .", cancel "*occidentalis*, sp. nov.", add "18a."

Then add: "18a(18) LA without any excisions, but with a conspicuous spine at apex. South-western Australia . . . *mallee*, sp. nov.

LA with excisions at apex, without such a spine . . . 18aa.

18aa(18a) LA with a deep median and a narrow lateral excision.

Lateral rim of MA rather low. Mid western Australia south of

Great Sandy Desert . . . *occidentalis* Baehr & Baehr

LA with less deep median and a conspicuously circular lateral

excision. Lateral rim of MA high, lamelliform. South-western

Australia . . . *marri*, sp. nov."

Couplet 36(35) cancel "*pseudocircumvidens*, sp. nov.", add "36a".

Then add "36a(36) Introductory duct basally coiled. South-

western Australia . . . *pseudocircumvidens* Baehr & Baehr

Tamopsis mallee sp. nov.

(Figures 7, 8, 9)

Holotype

Male, W.A., 50 km s. of Norseman, 10 November 1987, M. Baehr (WAM 88 1431).

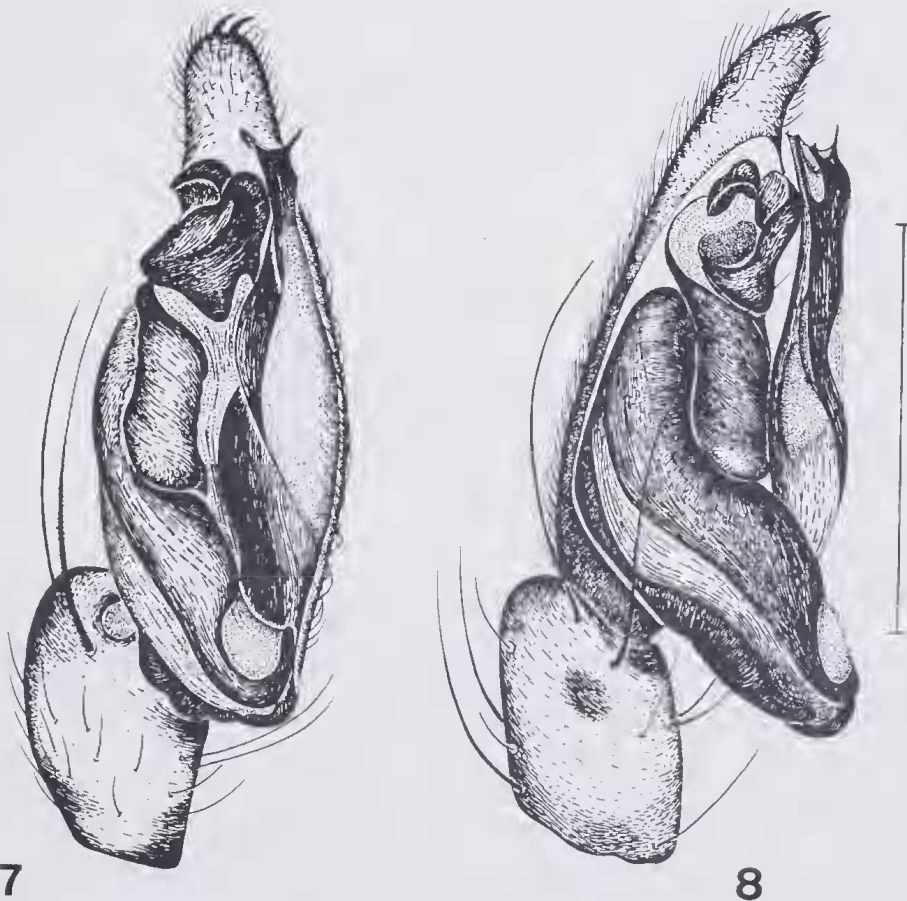
Diagnosis

Medium-sized, dark species with high eye area, very elongate legs, and large AME, distinguished by male palpus apically without distinct excision on lateral apophysis, but with a conspicuous rearward spine.

Description

Measurements: Length: 3.88mm; cephalothorax length: 1.76mm; width: 1.64mm; abdomen length: 2.08mm; width 1.72mm. Legs: I: 15.92mm, II: 15.08mm, III: 4.80mm, IV: 14.28mm. Ratio: I:0.95:II:0.90. Ratio LB/LL: 0.24. PLS length: 1.76mm; bS: 0.52mm; tS: 1.24mm. Eye ratio: L:0.3:0.58:0.78.

Colour: Cephalothorax rather dark, only centre yellow and lateral parts of clypeus indistinctly yellowish. Eye area darkest. Abdomen strongly mottled, with clearly delimited lancet-shaped stripe and less well delimited lateral stripes. Sternum and ventral surface of abdomen in parts greyish. Palpi and legs strongly annulate. Terminal



Figures 7 and 8. *Tamopsis mallee* sp. nov. Holotype. Male palpus. 7. ventral view, 8. lateral view. Scale: 0.5 mm.

segment of palpi anteriorly dark with conspicuous yellow spot. PLS laterally streaked with black and with a black subapical ring.

Cephalothorax: Circular, slightly longer than wide, c. as wide as abdomen. Eye area very high, clypeus almost as high as eye area. AME very large, by far largest. PLE considerably larger than PME. Distance AME/AME only half of diameter of AME, distance AME/ALE c. similar. Distance PME/PME c. as great as diameter of PME, distance PME/PLE c. 1 1/4 of diameter of PLE. Chelicerae c. twice as long as wide. Sternum pentagonal, hirsute.

Abdomen: Elongate, much longer than wide. Dorsally with five pairs of circular muscular pits. Ventral muscular pits in a narrow v-shaped arrangement. PLS considerably shorter than abdomen, tS rather short.

Legs: For measurements see above. Very elongate, III rather short.

Palpus: Elongate and narrow. Median apophysis with large membraneous area at apex and a fairly large scopula-like organ within. Hook-shaped process on rim of median apophysis large and very wide. Lateral rim sharp, rather lamelliform. Lateral apophysis narrow, elongate, not much contorted. Apex narrow, both excisions closed by membranes, lateral excision very narrow. With a conspicuous spine on rear part of apex.

Female: Unknown.

Entymology

Alludes to the mallee form of *Eucalyptus*.

Distrubution

Known only from type locality in the interior of south-western Australia.

Habits

The unique specimen was caught by beating large branches of mallee eucalypts in a stand of dense, high mallee. The specimen was found amongst large pieces of bark fallen into the umbrella.

Relationships

T. mallee is another highly derived species of the *tropica*-group. Perhaps it is most closely related to *T. fitzroyensis* Baehr & Baehr, which possesses, however, much more striking apomorphic characters in the male palpus than *T. mallee*. The almost closed lateral excision of lateral apophysis is presumably a synapomorphic character state of both species. Otherwise, *T. mallee* is rather similar to *T. occidentalis* and is distinguished from this species mainly by the different apex of the lateral apophysis of male palpus, whereas the median apophysis is rather similar. As the female of *T. mallee* is still unknown, nothing can be said on the relationship with *T. pseudocircumvidens* Baehr & Baehr. In several external characters both species seem fairly similar and they occur in the same area, the interior of south-western Australia. It is possible, therefore, that *T. mallee* and *T. pseudocircumvidens* are identical species, but the decision must await the discovery of both sexes in the same locality.

Identification

See under *T. marri* sp. nov.

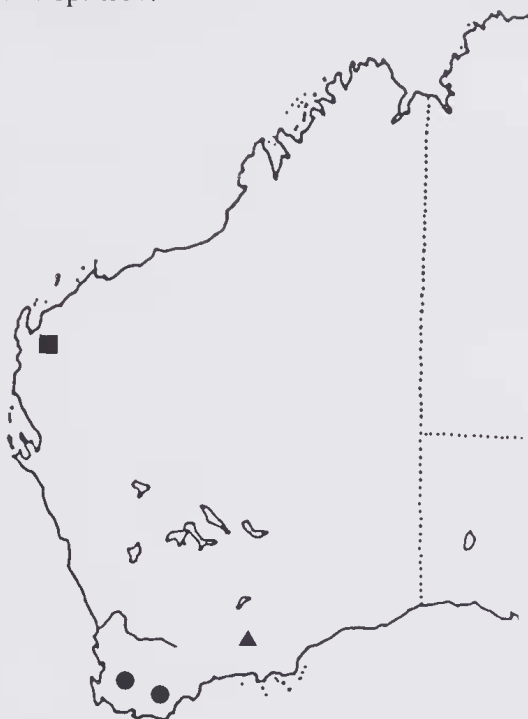


Figure 9 Distribution of *Tamopsis nanutarrae* sp. nov.: ■, *T. marri* sp. nov.: ●, and *T. mallee* sp. nov.: ▲.

Collecting records of other species

Tamopsis perthensis Baehr & Baehr

Baehr & Baehr, 1987, p. 386.

1 male, W.A. Stirling Range Nat. Pk., North border, 28 November 1987, M. & B. Baehr (CBM); 1 female, W.A., 2 km n. of North border of Stirling Range Nat. Pk., 28 November 1987, M. & B. Baehr (CBM).

Both records are from the most easterly part of range of this species, and both specimens were from the bark of Marri eucalypt.

Tamopsis occidentalis Baehr & Baehr

Baehr & Baehr, 1987, p. 387.

1 female, 2 juveniles, W.A., Wooramel River at Wooramel Roadhouse, 1 November 1987, M. Baehr (CBM); 1 female, W.A., Gaseoyne River, 15 km n. of Carnarvon, 2 November 1987, M. Baehr (CBM); 2 males, 2 females, 1 juvenile, W.A., Ashburton River at Nanutarra Roadhouse, 3 November 1987, M. Baehr (CBM).

The record from Wooramel River extends the range of this species to the south. Nevertheless, this is still a dry country species which has been found mostly on river eucalypt.

Remarks

All three new species belong to or are very closely related to the *tropica*-group the largest, most homogenous, and perhaps most evolved subunit of the genus *Tamopsis* (Baehr & Baehr 1987). Whereas *T. nanutarrae* is very primitive, in some characters yet more primitive than *T. tropica* Baehr & Baehr, *T. marri* and *T. mallee* are highly evolved. Both are rather related to *T. occidentalis* Baehr & Baehr and differ only in minor details of male and female genitalia.

With the discovery of these new species it becomes more evident that south-western Australia is an important centre of evolution within the genus *Tamopsis*. This is true, however, only for the *tropica*-group and its nearest allies. If our opinion is right that *T. marri* is the sister species of *T. occidentalis* and that *T. mallee* is still more evolved than the latter species, then our thoughts on the evolution of the Western Australian species expressed in our revision (Baehr & Baehr 1987) must be slightly altered. The zoogeographical events seem to have been less simple than we thought, because both new species occur south or southeast of the range of *T. occidentalis*, and the character evolution did not take place in a simple single-track direction, but there must have been multiple events in South-western Australia, where now perhaps six different species of the *tropica*-group, all highly evolved, are known to occur.

All species of central and southern Western Australia are apparently very closely related. This applies certainly to those species with known males: *T. perthensis* Baehr & Baehr, *T. occidentalis* Baehr & Baehr, *T. marri* sp. nov., *T. mallee* sp. nov., but perhaps also to *T. pseudocircumvidens* Baehr & Baehr and *T. rossii* Baehr & Baehr which are known only as females. Hence, evolution and differentiation of species must have been very recent events, in some cases perhaps not earlier than in the last interglacial, when dry corridors, perhaps yet drier than today, opened between different arcs of the central-western and south-western part of Western Australia.

Acknowledgements

We thank the authorities of the Deutsche Forschungsgemeinschaft (DFG) for supporting this paper by a travel grant.

References

- Baehr, B. and M. Baehr (1987). The Australian Hersiliidae (Arachnida: Araneae): Taxonomy, phylogeny, zoogeography. *Invertebr. Taxon.* 1: 351-437.
- Baehr, B. and M. Baehr (1988). On Australian Hersiliidae from the South Australian Museum (Arachnida: Araneae). Supplement to the revision of the Australian Hersiliidae. *Rec. S. Aust. Mus.* 22: 13-20.